

1 recover before project-related surface disturbance because of a lack of buried seed (Baker 2000),
2 relatively long distances to upwind seed sources, continued wind erosion, and competition by weedy
3 species.

4
5 In contrast, some of the pre-fire shrub and understory vegetation in the moderately burned areas
6 (including most of Area C and the ERDF) was not removed or is recovering, and these areas have not
7 been affected as severely by wind erosion. These plant communities thus have likely retained more of
8 their buried seed than those that were severely burned; this seed may germinate when conditions are
9 suitable. Consequently, some of these communities are expected to partially or fully recover before
10 project-related disturbance, notwithstanding competition by weedy species.

11 12 **I.2 Impacts to Terrestrial Resources Resulting from** 13 **Surface Disturbance**

14 15 **I.2.1 Alternative Group A**

16
17 **LLBGs in the 200 East Area – Impacts to Habitats and Plant Species of Concern.** The LLBGs in
18 the 200 East Area are surveyed annually, consistent with the DOE *Ecological Compliance Assessment*
19 *Management Plan* (ECAMP) (DOE-RL 1995a). The 218-E-10 and 218-E-12B LLBGs have been cleared
20 of most of their original vegetation, greatly increasing their susceptibility to noxious weed invasion.

21
22 Noxious weeds on the Hanford Site are managed under the Integrated Pest Management (IPM)
23 program (WHC 1995), and the primary means of control is herbicides. IPM personnel are required to
24 obtain training, licenses, and certifications (WHC 1995) in order to ensure compliance with Washington
25 State Department of Agriculture rules relating to the use of restricted herbicides in ground and aerial
26 applications. Compliance with these rules facilitates effective control of target populations with minimal
27 accidental overspray of and herbicide drift into non-target areas. Herbicide drift is minimized primarily
28 by deploying herbicides under optimal weather conditions (Renne and Wolf 1976) and using drift
29 retardants. Drift retardants increase droplet size, increasing settling rate and thus rendering herbicides
30 less susceptible to drift.

31
32 Cheatgrass and Sandberg's bluegrass (*Poa sandbergii*), a native perennial, dominate approximately
33 two-thirds of the 218-E-10 and 218-E-12B LLBGs. Crested wheatgrass (*Agropyron cristatum*), a non-
34 native perennial planted for a variety of purposes including dust suppression and reduction of water
35 infiltration into the vadose zone, dominates the other third (Brandt 1998, 1999; Sackschewsky 2000,
36 2001, 2002a). The 218-E-10 and 218-E-12B LLBGs receive regular herbicide applications and thus have
37 essentially no habitat value for native broad-leaved species such as big sagebrush (*Artemisia tridentata*).
38 Consequently, continued use of these LLBGs, or new disturbance of the extant plant communities within
39 them, would not result in the loss of any habitats designated by Washington State as priority habitats
40 (DOE-RL 2003). However, native habitats could develop if herbicide spraying ceases.

41
42 Two plant species of concern have been observed within the 218-E-10 and 218-E-12B LLBGs. The
43 most notable is Piper's daisy (*Erigeron piperianus*). The State of Washington Natural Heritage Program

(WHNP) lists Piper’s daisy as sensitive (a taxon that is vulnerable or declining and could become endangered or threatened in Washington without active management or removal of threats [WNHP 2002]) (Sackschewsky and Downs 2001). Sensitive species are considered Level III resources (Table I.1) under the *Hanford Site Biological Resources Management Plan* (BRMaP) (DOE-RL 2001). This species was observed within the 218-E-12B and 218-E-10 LLBGs during spring 1999 (Brandt 1999) but not in spring 2000, 2001, or 2002 (Sackschewsky 2000, 2001, 2002a). Piper’s daisy populations on these two LLBGs have been reduced or eliminated, likely as a result of regular herbicide applications. However, these populations could regenerate from buried seed, particularly if herbicide spraying ceases.

Table I.1. Hanford Site Biological Resources Management Plan Resource Levels and Their Definitions

Resource Level	Definition
I	Those resources that—because of their recreational, commercial, or ecological role or previous protection status—require at a minimum some level of status monitoring. Mitigation is not normally required.
II	Those resources that—to show compliance with procedural and substantive laws such as NEPA, CERCLA, and the Migratory Bird Treaty Act—require consideration of potential adverse impacts. Mitigation is most often accomplished by avoidance and impact minimization, except in the case of recovering shrub-steppe habitat, ^(a) for which mitigation via rectification or compensation is recommended.
III	Those resources that—because of their state listing, potential for federal or state listing, unique or significant value for plant, fish, or wildlife species, special administrative designation, or environmental sensitivity—require mitigation. When avoidance and minimization are not possible or are insufficient, mitigation via rectification or compensation is recommended.
IV	Those resources that—because of their federally protected legal status or their regional and national significance—justify preservation and the primary management option. Typically, these cannot be mitigated unless it is by compensation via acquisition and protection of in-kind resources.
(a) Habitat characterized by short-statured, widely spaced, small-leaved shrubs, sometimes aromatic (of, related to, or containing the six-carbon ring typical of the benzene series and related organic groups), with brittle stems and an understory dominated by perennial bunchgrasses.	

The other plant species of concern observed within the 218-E-10 and 218-E-12B LLBGs is crouching milkvetch (*Astragalus succumbens*), a Washington State Watch List species (plant taxon that is of concern but is considered to be more abundant and/or less threatened in Washington than previously assumed [WNHP 2002]) (Sackschewsky and Downs 2001). Watch List species are considered Level I resources (Table I.1) under BRMaP (DOE-RL 2001). This species was observed in spring 2000, 2001, and 2002 within Trench 94 in the 218-E-12B LLBG and on the northeast side of the 218-E-10 LLBG (Sackschewsky 2000, 2001, 2002a). Crouching milkvetch is relatively common on the Central Plateau (Sackschewsky and Downs 2001). Therefore, disturbance of those individuals on the 218-E-12B and 218-E-10 LLBGs would not be likely to adversely affect the overall local population.

LLBGs in the 200 West Area – Impacts to Habitats and Plant Species of Concern. The LLBGs in the 200 West Area are surveyed annually consistent with ECAMP (DOE-RL 1995a). The 218-W-3A, 218-W-3AE, 218-W-4B, and 218-W-5 LLBGs in the 200 West Area are sparsely colonized by

1 cheatgrass, Russian thistle, and crested wheatgrass (Brandt 1998, 1999; Sackschewsky 2000, 2001,
2 2002a). These receive regular herbicide applications and thus have essentially no habitat value for native
3 species. Consequently, continued use of these LLBGs, or new disturbance of the extant plant commu-
4 nities within them, would not result in the loss of any habitats designated by Washington State as priority
5 habitat (DOE-RL 2003). However, native habitats could develop if herbicide spraying ceases.

7 Most of the developed portion of the 218-W-4C LLBG, bounded on the west by Dayton Avenue and
8 on the north and south by 19th and 16th streets, respectively, is highly disturbed and has a sparse cover of
9 cheatgrass. However, some portions of this LLBG now have relatively thick stands of Indian ricegrass
10 (*Oryzopsis hymenoides*) and needle-and-thread grass (*Stipa comata*) (Brandt 1998, 1999; Sackschewsky
11 2000, 2001, 2002a), both native perennial species. This developed portion of the 218-W-4C LLBG
12 receives regular herbicide applications and thus has essentially no habitat value for native species.
13 Consequently, continued use of the developed portion of the 218-W-4C LLBG, or new disturbance of the
14 extant plant communities within it, would not result in the loss of any habitats designated by Washington
15 State as priority habitat (DOE-RL 2003). However, native habitats could develop if herbicide spraying
16 ceases.

18 The undeveloped southeastern portion of the 218-W-4C LLBG, along 16th Street, is dominated by
19 mature sagebrush, with gray and green rabbitbrush (*Chrysothamnus nauseosus*) as minor overstory
20 components. The understory consists primarily of needle-and-thread grass, cheatgrass, and crested
21 wheatgrass. Development of the southeastern portion of the 218-W-4C LLBG would result in the loss of
22 sagebrush steppe (shrub-steppe dominated by sagebrush), considered a priority habitat by the State of
23 Washington (DOE-RL 2003) and a Level III resource under BRMaP (DOE-RL 2001).

25 One plant species of concern has been observed within some of the 200 West LLBGs—stalked-pod
26 milkvetch (*Astragalus sclerocarpus*), a Washington State Watch List species (Sackschewsky and Downs
27 2001) and thus a Level I resource (DOE-RL 2001). Stalked-pod milkvetch was observed in spring 1998,
28 1999, 2000, 2001, and 2002 at the extreme western edge of the 218-W-5 LLBG and within the
29 undeveloped portion of the 218-W-4C LLBG (Brandt 1998, 1999; Sackschewsky 2000, 2001, 2002a).
30 Stalked-pod milkvetch is relatively common on the Central Plateau (Sackschewsky and Downs 2001).
31 Therefore, disturbance of those individuals on the 218-W-5 and 218-W-4C LLBGs would not likely
32 adversely affect the overall local population.

34 **LLBGs in the 200 East and 200 West Areas – Impacts to Wildlife and Wildlife Species of**
35 **Concern.** Wildlife that could be impacted by disturbance of the 200 East and 200 West LLBGs includes
36 the mule deer (*Odocoileus hemionus*), Great Basin pocket mouse (*Perognathus parvus*), side-blotched
37 lizard (*Uta stansburiana*), and several migratory bird species. Ground-nesting birds that have been
38 observed, and that may nest within the 200 East and 200 West LLBGs, include the horned lark
39 (*Eremophila alpestris*), killdeer (*Charadrius vociferous*), long-billed curlew (*Numenius americanus*), and
40 Western meadowlark (*Sturnella neglecta*) (Sackschewsky 2001). Ground disturbance during the nesting
41 season, generally March through July, could destroy eggs and young and temporarily displace nesting
42 individuals into other areas of the Hanford Site. The nests, eggs, and young of migratory birds are

protected under the Migratory Bird Treaty Act (MBTA) (16 USC 703-712, as amended). Protection is generally accomplished by conducting ground-disturbing activities outside the nesting season, generally August through February.

Proposed Disposal Facility Near the PUREX Plant in 200 East Area – Impacts to Habitats and Plant Species of Concern. The proposed disposal facility near the PUREX Plant is surveyed annually consistent with ECAMP (DOE-RL 1995a). Unlike the majority of the LLBGs, the original vegetation in the proposed disposal facility near the PUREX Plant has not been cleared. The overstory is dominated by sagebrush (25% cover), with green rabbitbrush (*Chrysothamnus viscidiflorus*) as a minor component. The understory is dominated by cheatgrass and Sandberg's bluegrass. Development of the proposed disposal facility near the PUREX Plant would result in the loss of sagebrush steppe, considered a priority habitat by the State of Washington (DOE-RL 2003) and a Level III resource under BRMaP (DOE-RL 2001). No plant species of concern were observed in the proposed disposal facility near the PUREX Plant during the annual field survey of summer 2002.

Proposed Disposal Facility Near the PUREX Plant in 200 East Area – Impacts to Wildlife and Wildlife Species of Concern. Wildlife that could be affected by disturbance of the proposed disposal facility near the PUREX Plant includes the black-tailed jackrabbit (*Lepus californicus*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), Northern pocket gopher (*Thomomys talpoides*), and several migratory bird species. Shrub- and ground-nesting birds that have been observed and that likely nest within the proposed disposal facility near the PUREX Plant include the sage sparrow (*Amphispiza belli*) and Western meadowlark (*Sturnella neglecta*), respectively. Ground disturbance during the nesting season, generally March through July, could destroy eggs and young and temporarily displace nesting individuals into other areas of the Hanford Site. The nests, eggs, and young of migratory birds are protected under the MBTA. Protection is generally accomplished by conducting ground-disturbing activities outside the nesting season, generally August through February.

Two wildlife species of concern were observed within the proposed disposal facility near the PUREX Plant—the black-tailed jackrabbit and sage sparrow, both Washington State candidate species (species that the Washington Department of Fish and Wildlife will review for possible listing as endangered, threatened, or sensitive [WDFW 2002]). The distribution of the black-tailed jackrabbit (BMNHC 2002) and sage sparrow within Washington is limited mostly to the Columbia Basin. Both species have a strong affinity for sagebrush habitat. Removal of sagebrush within the proposed disposal facility near the PUREX Plant would likely have a minimal impact on populations of these species within the Columbia Basin.

Area C – Impacts to Habitats. Much of the original vegetation in Area C was burned in the 24 Command Fire. Pre-fire plant communities and land cover types in Area C consisted of the following:

- needle-and-thread grass/Indian ricegrass
- big sagebrush/needle-and-thread grass
- bluebunch wheatgrass (*Agropyron spicatum*)/Sandberg's bluegrass
- rabbitbrush (*Chrysothamnus* spp.)/bunchgrass mosaic
- Sandberg's bluegrass/cheatgrass

- big sagebrush/Sandberg's bluegrass/cheatgrass
- abandoned old agricultural fields
- disturbed (inactive borrow pit) (Figure I.1).

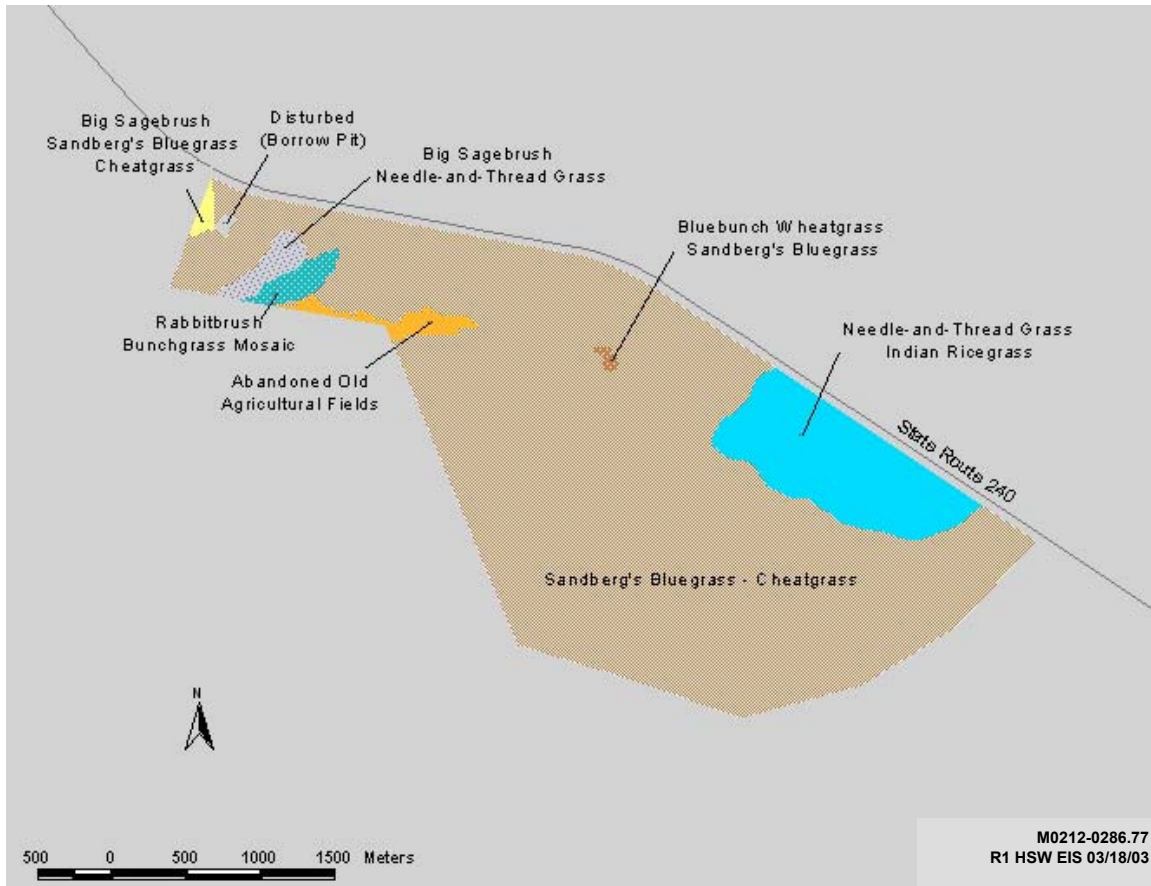


Figure I.1. Plant Communities in Area C Before the 24 Command Fire of June 2000 (Data collected 1994 and 1997 by TNC; 1991 and 1999 by Pacific Northwest National Laboratory [PNNL]. Map created January 2002 by PNNL).

Needle-and-Thread Grass/Indian Ricegrass. The pre-fire needle-and-thread grass/Indian ricegrass community was designated a potential bitterbrush (*Purshia tridentata*)/Indian ricegrass sand dune complex community (Figure I.2) by The Nature Conservancy (TNC) of Washington. A potential plant community is one that, with the passage of time, is projected to dominate an undisturbed site, based on climate and other abiotic factors (Soll and Soper 1996). Thus, development of the potential bitterbrush/Indian ricegrass community is based on long-term colonization by bitterbrush and eventual domination of the understory by Indian ricegrass.

The pre-fire needle-and-thread grass/Indian ricegrass community was designated an element occurrence of the bitterbrush/Indian ricegrass sand dune complex community type (Figure I.3). An element occurrence of a community type is one that meets the minimum standards set by the WNHP for

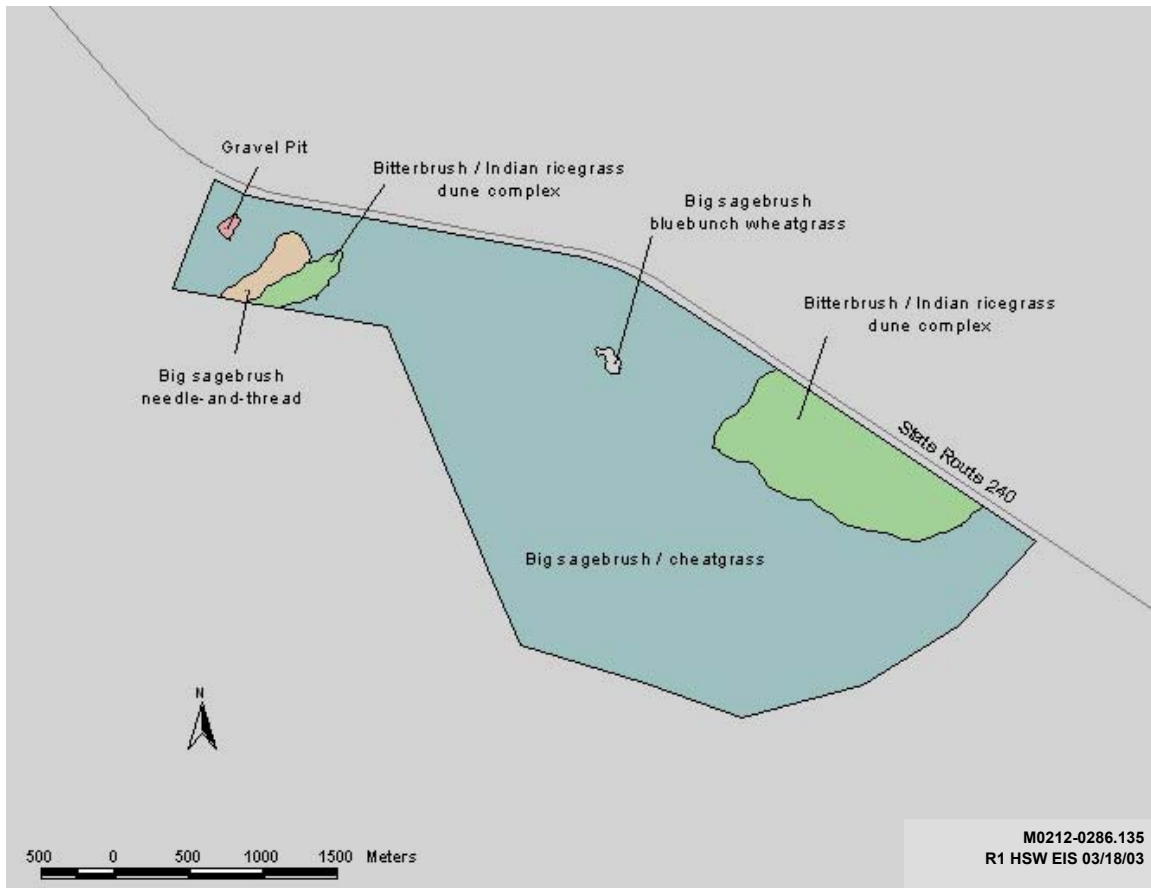


Figure I.2. Potential Plant Communities in Area C (Data collected 1994 and 1997 by TNC; 1991 and 1999 by PNNL. Map created January 2002 by PNNL).

ecological condition, size, and the surrounding landscape. Element occurrences are generally considered to be of significant conservation value from a state and/or regional perspective. More specifically, element occurrences on the Hanford Site may be considered integral to the preservation and sustenance of biodiversity in the Columbia Basin shrub-steppe. Element occurrences are tracked by the WNHP.

Element occurrences are designated Level IV resources (Table I.1) in BRMaP (DOE-RL 2001), the highest level of resource designation at the Hanford Site. Element occurrences, because of their regional significance, justify preservation as the primary management option, and impacts to these should be avoided where possible (DOE-RL 2001).

The dominant plant species in this community, as determined by ocular estimation of percentage ground cover, currently are cheatgrass (50 percent), needle-and-thread grass (15 percent), and Indian ricegrass (10 percent) (Attachment A to this appendix; Sackschewsky 2002d). This needle-and-thread grass/Indian ricegrass community should thus be re-designated cheatgrass/needle-and-thread grass/Indian

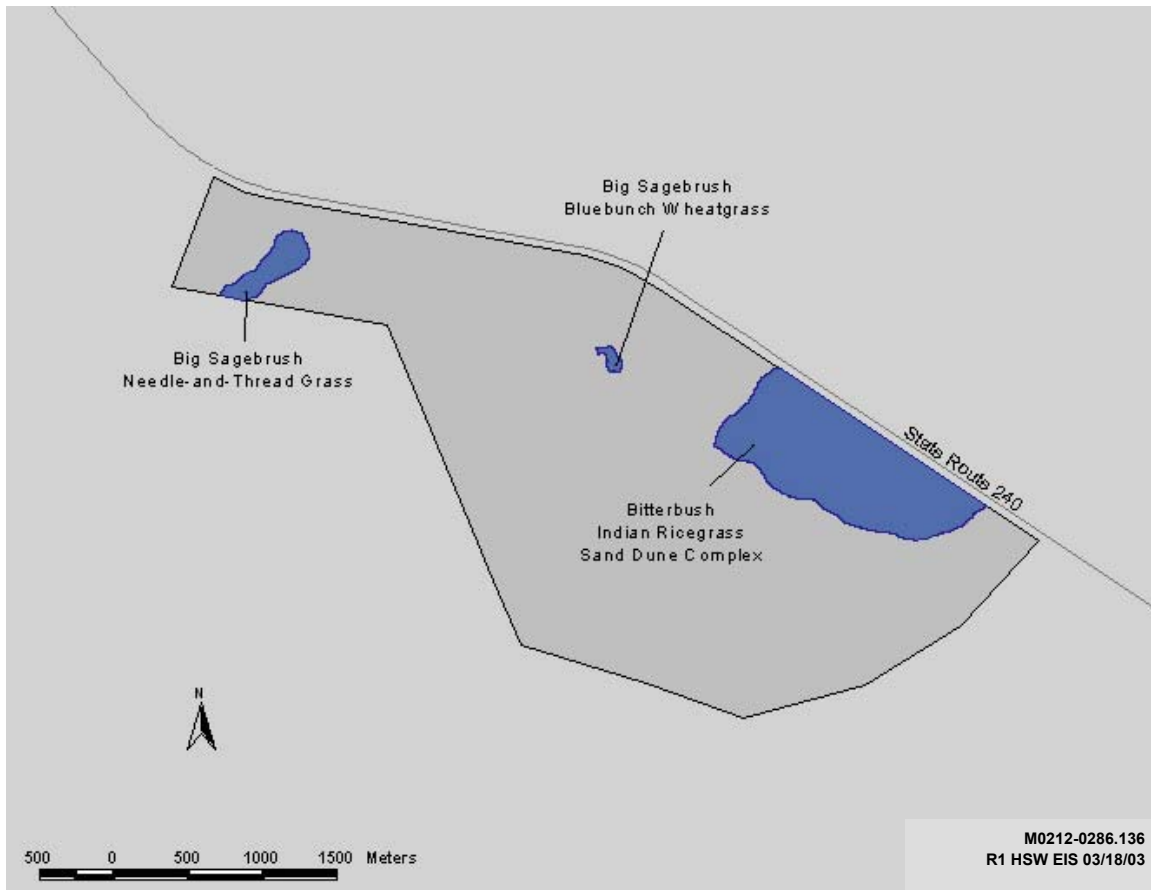


Figure I.3. Element Occurrences of Plant Community Types in Area C (Data collected 1994, 1995, and 1997 by TNC; 1996 by WNHP. Map created January 2002 by PNNL).

ricegrass (Figure I.4). Because bitterbrush is not currently present in this community (Attachment A to this appendix; Sackschewsky 2002d), it appears unlikely that it will become a bitterbrush/Indian ricegrass community prior to the start of new construction.

Big Sagebrush/Needle-and-Thread Grass. No potential (more advanced) community type has been designated by TNC for this pre-fire big sagebrush/needle-and-thread grass community (Figure I.2) (Soll and Soper 1996). This pre-fire community was designated an element occurrence (Figure I.3) (Soll and Soper 1996). However, big sagebrush appears to have been absent in the pre-fire community, based on observations made in the field in February and June 2002 (Sackschewsky 2002c, 2002d; Attachment A to this appendix), during which no burned shrub stumps and virtually no other burned shrub residue (e.g., branches) were observed. Therefore, its designation as an element occurrence may have been erroneous. However, this determination can be made only by the WNHP.

This community is currently much smaller than that defined by TNC (compare Figures I.1, I.2, and I.3 with I.4). The dominant plant species in this community currently are needle-and-thread grass (20 percent) and cheatgrass (20 percent) (Attachment A to this appendix; Sackschewsky 2002d). This big

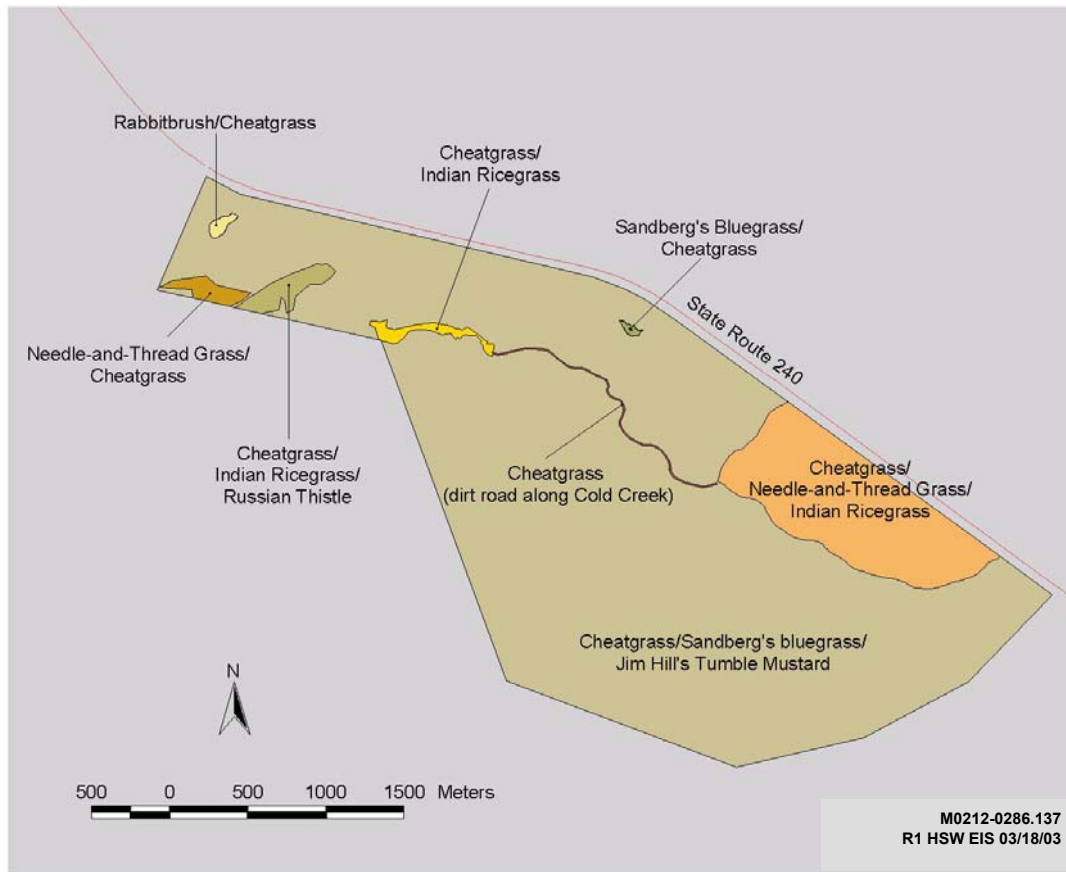


Figure I.4. Plant Communities in Area C After the 24 Command Fire of June 2000 (Data collected June and July 2002 by PNNL. Map created October 2002 by PNNL).

sagebrush/ needle-and-thread grass community should thus be re-designated needle-and-thread grass/cheatgrass (Figure I.4). Because sagebrush is not currently present in this community (Attachment A to this appendix; Sackschewsky 2002d), it appears unlikely that it could become a big sagebrush/needle-and-thread grass community prior to the start of new construction.

Bluebunch Wheatgrass/Sandberg's Bluegrass. The pre-fire bluebunch wheatgrass/Sandberg's bluegrass community, designated a potential big sagebrush/bluebunch wheatgrass community (Figure I.2) by Soll and Soper (1996), was designated an element occurrence of the big sagebrush/bluebunch wheatgrass community (Figure I.3) (Soll and Soper 1996).

The dominant plant species in this community currently are Sandberg's bluegrass (40 percent) and cheatgrass (10 percent). Bluebunch wheatgrass is a minor component of this community, i.e., much less than 1 percent cover (Attachment A to this appendix; Sackschewsky 2002d). This bluebunch wheatgrass/Sandberg's bluegrass community should thus be re-designated Sandberg's bluegrass/cheatgrass (Figure I.4). The designation of this community as an element occurrence may be erroneous due to the insignificant amount of bluebunch wheatgrass. However, this determination can be made only by the WNHP. Because sagebrush is not currently present in this community (Attachment A to this appendix;

1 Sackschewsky 2002d), it appears unlikely that it could become a big sagebrush/bluebunch wheatgrass
2 community prior to the start of new construction.

3
4 **Rabbitbrush/Bunchgrass Mosaic.** This pre-fire rabbitbrush/bunchgrass mosaic community has
5 been designated a potential bitterbrush/Indian ricegrass sand dune complex community (Figure I.2) by
6 Soll and Soper (1996).

7
8 The dominant plant species in this community currently are cheatgrass (20 percent), Indian ricegrass
9 (10 percent), and Russian thistle (10 percent). Scattered burned and living rabbitbrush were a minor
10 component of this community, i.e., much less than 1 percent cover (Attachment A to this appendix;
11 Sackschewsky 2002d). This community should thus be re-designated cheatgrass/Indian ricegrass/Russian
12 thistle (Figure I.4). Because living rabbitbrush are currently present (Attachment A to this appendix;
13 Sackschewsky 2002d), and given the substantial Indian ricegrass component, this community will likely
14 recover to its pre-fire condition (i.e., rabbitbrush/bunchgrass mosaic community) before the start of new
15 construction.

16
17 **Sandberg's Bluegrass/Cheatgrass.** This area was designated a potential big sagebrush/cheatgrass
18 community (Figure I.2) by Soll and Soper (1996). The dominant plant species in this community, except
19 for the dirt road along Cold Creek, currently are cheatgrass (55 percent), Sandberg's bluegrass
20 (15 percent), and Jim Hill's tumble mustard (*Sisymbrium altissimum*) (10 percent) (Attachment A to this
21 appendix; Sackschewsky 2002d), an alien, annual weed. This community should thus be re-designated
22 cheatgrass/ Sandberg's bluegrass/Jim Hill's tumble mustard (Figure I.4). The dominant plant species
23 along the dirt road along Cold Creek is cheatgrass (50 percent) (Attachment A to this appendix;
24 Sackschewsky 2002d), and should be considered a separate community (Figure I.4).

25
26 Widely scattered mature big sagebrush (<1 percent cover in the area of its occurrence [Attachment A
27 to this appendix; Sackschewsky 2002d]), of which approximately 10 percent were alive, were observed in
28 the southeastern portion of this cheatgrass/Sandberg's bluegrass/Jim Hill's tumble mustard community,
29 within approximately 200 m (656 ft) of the border of Area C. This portion of the cheatgrass/Sandberg's
30 bluegrass/Jim Hill's tumble mustard community is thus a Level II resource (Table I.1) under BRMaP
31 (DOE-RL 2001). Seeding from remnant mature sagebrush may enable this portion of the community to
32 become big sagebrush/cheatgrass before the start of new construction. However, because living, mature
33 sagebrush are currently scarce and very limited in distribution, and given the relatively long upwind
34 distance to external seed sources, the potential for sagebrush colonization of the remainder of this
35 community before the start of new construction is expected to be low.

36
37 **Big Sagebrush/Sandberg's Bluegrass/Cheatgrass.** This area was designated a potential big
38 sagebrush/cheatgrass community (Figure I.2) by Soll and Soper (1996). The dominant plant species in
39 this community currently are cheatgrass (55 percent), Sandberg's bluegrass (15 percent), and Jim Hill's
40 tumble mustard (*Sisymbrium altissimum*) (Attachment A to this appendix; Sackschewsky 2002d). This
41 community should thus be re-designated cheatgrass/Sandberg's bluegrass/Jim Hill's tumble mustard
42 (Figure I.4). No evidence was found to indicate that sagebrush had been a component of the pre-fire
43 community, and sagebrush is not currently present in this area (Attachment A to this appendix;
44 Sackschewsky 2002d). Thus, it appears unlikely that this area could become a big sagebrush/cheatgrass
45 community prior to the start of new construction.

1 **Abandoned Old Agricultural Fields.** This area was designated a potential big sagebrush/cheatgrass
2 community (Figure I.2) by Soll and Soper (1996). The dominant plant species in this community
3 currently are cheatgrass (20 percent) and Indian ricegrass (10 percent) (Attachment A to this appendix;
4 Sackschewsky 2002d). This community should thus be designated cheatgrass/Indian ricegrass
5 (Figure I.4) because the current designation provides no information on species composition. Because
6 sagebrush is not currently present in this area (Sackschewsky 2002d), it appears unlikely that this area
7 could become a big sagebrush/cheatgrass community prior to the start of new construction.
8

9 **Disturbed (Inactive Borrow Pit).** Based on observations made in the field in February and June
10 2002 (Sackschewsky 2002c, 2002d), the inactive borrow pit was virtually unaffected by the 24 Command
11 Fire, although vegetation all around it was removed. The dominant plant species in this community
12 currently are gray rabbitbrush (5 percent) and cheatgrass (30 percent). Sagebrush is a minor component,
13 at 1 percent cover (Attachment A to this appendix; Sackschewsky 2002d). This community should thus
14 be designated gray rabbitbrush/cheatgrass (Figure I.4) because the current designation provides no
15 information on species composition. Because the overstory is dominated by rabbitbrush and sagebrush is
16 sub-dominant, this community should be considered a Level II resource under BRMaP (DOE-RL 2001).
17

18 **Area C – Impacts to Wildlife.** Wildlife that could be affected by disturbance of Area C include
19 mammals—the badger (*Taxidea taxus*), coyote, elk (*Cervus elaphus*), mule deer, and Northern pocket
20 gopher; birds—the horned lark, lark sparrow (*Chondestes grammacus*), rock wren (*Salpinctes obsoletus*),
21 short-eared owl (*Asio flammeus*), and Western meadowlark; and reptiles—the side-blotched lizard
22 (Attachment A to this appendix; Sackschewsky 2002d).
23

24 Of these avian species, those that are ground-nesting and that may nest within Area C include the
25 horned lark and Western meadowlark. Ground disturbance during the nesting season, generally March
26 through July, could destroy eggs and young and temporarily displace nesting individuals into other areas
27 of the Hanford Site. The same temporal restrictions as set forth above in **LLBGs in the 200 East and**
28 **200 West Areas – Impacts to Wildlife and Wildlife Species of Concern** (page I.4) apply for
29 conducting ground-disturbing activities outside the nesting season to protect the nests, eggs, and young of
30 these species in this area.
31

32 An elk herd of approximately 660 animals uses the ALE Reserve and surrounding private lands
33 (Tiller et al. 2000). After the 24 Command Fire, little vegetation was available on the ALE Reserve.
34 Core use areas during the calving (March–June) and post-calving (July–August) periods in 2000 generally
35 centered along the southern border of the ALE Reserve, largely on private lands in range and agricultural
36 areas (Tiller et al. 2000). However, one of the core areas used by bulls during the calving period centered
37 on State Route 240 and included part of the Hanford Central Plateau southeast of Area C (Tiller et al.
38 2000). In addition, elk are known to also move extensively north of State Route 240 (SR 240), east and
39 south of Area C, from fall through spring. Although most of these movements onto the Hanford Central
40 Plateau are located east and south of Area C, elk also have been observed using Area C (e.g., during
41 summer 2002 [see Attachment A to this appendix]). Use of Area C appears to be restricted to foraging
42 and loafing. Calving generally occurs at the upper elevations of Rattlesnake Mountain.
43

1 Blasting and use of heavy equipment to remove borrow materials from Area C undoubtedly will
2 disturb elk and displace some animals into adjacent areas, particularly if conducted during the winter
3 months. However, because Area C comprises only a small portion of their overall range and is not known
4 to be particularly important for either overwintering or calving, the effect on the population is likely to be
5 minimal.

6
7 Blasting and use of heavy equipment to remove borrow materials from Area C undoubtedly will also
8 disturb the other mammalian species listed above and displace some individuals into adjacent areas.
9 However, because Area C is not known to be particularly important for any of these species, the effects
10 on local populations of these are likely to be minimal.

11
12 **Area C – Impacts to Plant and Wildlife Species of Concern.** According to Soll and Soper (1996),
13 there was a rare plant population of an unnamed species located within Area C, although its purported
14 location did not correspond to any of the areas searched by TNC during the rare plant surveys it
15 conducted on the ALE Reserve in the 1990s. In addition, this population was not referenced in the
16 BRMaP (DOE-RL 2001). This discrepancy was resolved during fieldwork conducted in June and July
17 2002, during which no rare plant population was observed (Sackschewsky 2002d).

18
19 The only plant species of concern observed within the Area C plant communities were purple mat
20 (*Nama densum* var. *parviflorum*), crouching milkvetch, and stalked-pod milkvetch (Attachment A to this
21 appendix; Sackschewsky 2002d). Purple mat is a Washington State Review 1 species (plant taxon of
22 potential concern that is in need of additional field work before a status can be assigned [WNHP 2002]).
23 Review 1 species are considered Level II resources under BRMaP (DOE-RL 2001).

24
25 Purple mat occurs occasionally throughout central Hanford (Sackschewsky and Downs 2001).
26 Crouching milkvetch and stalked-pod milkvetch are relatively common on the Central Plateau
27 (Sackschewsky and Downs 2001). Consequently, disturbance of the individuals of these three species
28 located in the Area C plant communities would not likely adversely affect the overall local populations.
29 The Area C plant communities (Figure I.4) in which these three species were observed are provided in
30 Table I.2.

31
32 No wildlife species of concern were observed in any of the Area C plant communities (Attachment A
33 to this appendix; Sackschewsky 2002d).

34
35 **Area C Stockpile Area and Conveyance Road – Impacts to Habitats and Wildlife.** The area
36 identified for the stockpile area and conveyance road north of SR 240 was severely burned in the
37 24 Command Fire. This area continues to be severely eroded by wind (Becker and Sackschewsky 2001a;
38 2001b; Sackschewsky and Becker 2001). Much of the topsoil, and likely much of the buried seed (Baker
39 2000), has been removed. Because of a lack of buried seed, relatively long distances to external upwind
40 seed sources, continued wind erosion, and competition by weedy species, sagebrush recovery is expected
41 to be minimal before the start of new construction.

Table I.2. Area C Plant Communities in Which Purple Mat, Crouching Milkvetch, and/or Stalked-Pod Milkvetch Were Observed (Attachment A to this appendix; Sackschewsky 2002d)

Plant Community	Species		
	Crouching Milkvetch	Purple Mat	Stalked-Pod Milkvetch
Cheatgrass/needle-and-thread grass/Indian ricegrass	(a)	X	X
Needle-and-thread grass/cheatgrass	X		
Sandberg's bluegrass/cheatgrass			
Cheatgrass/Indian ricegrass/Russian thistle			X
Cheatgrass/Sandberg's bluegrass/Jim Hill's tumble mustard	X	X	
Cheatgrass	X		
Cheatgrass/Indian ricegrass	X		
Gray rabbitbrush/cheatgrass			X
(a) Blank cells indicate that the species have not been found in the corresponding plant communities.			

The dominant plant species in this area currently are Russian thistle (30 percent), cheatgrass (15 percent), and dune scurfpea (*Psoralea lanceolata*) (10 percent) (Attachment A to this appendix; Sackschewsky 2002d).

Wildlife that could be affected by disturbance of the stockpile and conveyance road area include mammals—the black-tailed jackrabbit and coyote—and birds—the horned lark, mourning dove (*Zenaida macroura*), Western kingbird (*Tyrannus verticalis*), and Western meadowlark (Attachment A to this appendix; Sackschewsky 2002d).

Of these avian species, those that are ground-nesting and that may nest within the stockpile and conveyance road area include the horned lark and Western meadowlark. The same temporal restrictions as set forth above apply for conducting ground-disturbing activities outside the nesting season to protect the nests, eggs, and young of these species in this area.

Area C Stockpile Area and Conveyance Road – Impacts to Plant and Wildlife Species of Concern. The only plant species of concern observed within the area identified for the stockpile and conveyance road was stalked-pod milkvetch (Attachment A to this appendix; Sackschewsky 2002d). Because stalked-pod milkvetch is relatively common on the Central Plateau (Sackschewsky and Downs 2001), disturbance of the individuals located within the stockpile and conveyance road area would not likely adversely affect the overall local population.

Only one wildlife species of concern was observed within this area—the black-tailed jackrabbit (Attachment A to this appendix; Sackschewsky 2002d). Because sagebrush recovery in the area identified for the stockpile and conveyance road is expected to be minimal before the start of new construction, the impact of its eventual removal on the black-tailed jackrabbit within the Columbia Basin is likely to be insignificant.

1.2.2 Alternative Group B

LLBGs in the 200 East Area. No other impacts in addition to those described for habitats and plant and animal species under Alternative Group A are expected to occur under Alternative Group B. No other field surveys in addition to those described under Alternative Group A would be required under Alternative Group B.

LLBGs in the 200 West Area. Other potential impacts in addition to those described for habitats and plant and animal species under Alternative Group A may occur under Alternative Group B due to disposal in the 218-W-6 LLBG.

Most of the eastern half of the 218-W-6 LLBG has been previously disturbed and replanted to crested wheatgrass (Brandt 1998, 1999; Sackschewsky 2000, 2001, 2002a). The entire western half and a portion of the eastern half (on the northern edge) of the burial ground had not been disturbed prior to late 2001/2002 and consisted of sagebrush, spiny hopsage (*Grayia spinosa*), and Sandberg's bluegrass. However, these areas also were treated with herbicide during late 2001/early 2002 (Sackschewsky 2002a) prior to anticipated mechanical removal of vegetation (Sackschewsky 2002b) for the purpose of fire suppression.

With the exception of the northeastern corner, the eastern half of the 218-W-6 LLBG receives regular herbicide applications and thus has essentially no habitat value for native species. Vegetation on the western half and the northeastern corner of the 218-W-6 LLBG has been removed since the initial herbicide application of late 2001/2002, and these areas will continue to receive herbicide applications on a regular basis. Thus, they also will have essentially no habitat value for native species. Consequently, continued use of the 218-W-6 LLBG, or new disturbance of the extant plant communities within them, would not result in the loss of any habitats designated by Washington State as priority habitat (DOE-RL 2003). However, native habitats could develop if herbicide spraying ceases.

New Waste Processing Facility – Impacts to Habitats and Wildlife. The area identified for construction of the New Waste Processing Facility consisted of mature sagebrush habitat before the 24 Command Fire. The dominant plant species in this area currently is bur ragweed (*Ambrosia acanthacarpa*), a native annual weed (Attachment A to this appendix).

This area was severely burned and continues to be severely eroded by wind (Becker and Sackschewsky 2001a, 2001b; Sackschewsky and Becker 2001). Much of the topsoil and likely much of the buried seed (Baker 2000) have been removed. Because of a lack of buried seed, relatively long distances to external upwind seed sources, continued wind erosion, and competition by weedy species, sagebrush recovery is expected to be minimal within the time frame before the start of new construction.

Wildlife that could be affected by disturbance of the area identified for construction of the New Waste Processing Facility include the coyote (Attachment A to this appendix).

New Waste Processing Facility – Impacts to Plants and Wildlife Species of Concern. The only plant species of concern observed within the area identified for the New Waste Processing Facility was

1 stalked-pod milkvetch (Attachment A to this appendix). Because stalked-pod milkvetch is relatively
2 common on the Central Plateau (Sackschewsky and Downs 2001), disturbance of the individuals located
3 within the stockpile and conveyance road area would not likely adversely affect the overall local
4 population.

5
6 No wildlife species of concern were observed in this area (Attachment A to this appendix).

7
8 **ILAW Disposal Facility – Impacts to Habitats and Wildlife.** The area identified for construction
9 of the ILAW disposal facility was divided into two areas for the summer 2002 field surveys (Attachment
10 A to this appendix; Sackschewsky 2002d)—the W-5 Expansion Area and the area located north of 16th
11 Street and west of Dayton Avenue. Both areas consisted of mature big sagebrush habitat before the
12 24 Command Fire.

13
14 The dominant plant species in the W-5 Expansion Area currently are Sandberg's bluegrass
15 (20 percent), cheatgrass (15 percent), Indian ricegrass (10 percent), and Russian thistle (10 percent)
16 (Attachment A to this appendix; Sackschewsky 2002d). The dominant plant species in the area located
17 north of 16th Street and west of Dayton Avenue currently is Russian thistle (Attachment A to this
18 appendix; Sackschewsky 2002d).

19
20 Wildlife that could be affected by disturbance of the W-5 Expansion Area include mammals—the
21 badger, coyote, Great Basin pocket mouse, and mule deer; and birds—the horned lark, mourning dove,
22 and Western meadowlark (Attachment A to this appendix; Sackschewsky 2002d). Only the coyote and
23 Western meadowlark were observed in the area north of 16th Street and west of Dayton Avenue
24 (Attachment A to this appendix; Sackschewsky 2002d).

25
26 Of these avian species, those that are ground-nesting and that may nest within the W-5 Expansion
27 Area and the area located north of 16th Street and west of Dayton Avenue include the horned lark and
28 Western meadowlark. The same temporal restrictions as set forth above apply for conducting ground-
29 disturbing activities outside the nesting season to protect the nests, eggs, and young of these species in
30 these areas.

31
32 The W-5 Expansion Area and the area north of 16th Street and west of Dayton Avenue were severely
33 burned and continue to be severely eroded by wind (Becker and Sackschewsky 2001a, 2001b;
34 Sackschewsky and Becker 2001). Much of the topsoil and likely much of the buried seed (Baker 2000)
35 have been removed. Because of a lack of buried seed, relatively long distances to external upwind seed
36 sources, continued wind erosion, and competition by weedy species, sagebrush recovery is expected to be
37 minimal within the time frame before the start of new construction.

38
39 **ILAW Disposal Facility – Impacts to Plant and Wildlife Species of Concern.** The only plant
40 species of concern observed in the W-5 Expansion Area were crouching milkvetch, stalked-pod
41 milkvetch, and purple mat (Attachment A to this appendix; Sackschewsky 2002d). Crouching milkvetch
42 and purple mat were the only plant species of concern observed in the area north of 16th Street and west
43 of Dayton Avenue (Attachment A to this appendix; Sackschewsky 2002d). Because purple mat occurs
44 occasionally throughout central Hanford, and crouching milkvetch and stalked-pod milkvetch are

1 relatively common on the Central Plateau (Sackschewsky and Downs 2001), disturbance of the
2 individuals of these three species located in the W-5 Expansion Area and the area north of 16th Street and
3 west of Dayton Avenue would not likely adversely affect the overall local populations.

4
5 No wildlife species of concern were observed in the W-5 Expansion Area and the area located north
6 of 16th Street and west of Dayton Avenue (Attachment A to this appendix; Sackschewsky 2002d).

7
8 **Area C.** No other impacts to habitats and species in addition to those described under Alternative
9 Group A are expected to occur under Alternative Group B. No other field surveys in addition to those
10 described under Alternative Group A would be required under Alternative Group B.

11
12 **Area C Stockpile Area and Conveyance Road.** No other impacts to habitats and species in addition
13 to those described under Alternative Group A are expected to occur under Alternative Group B. No other
14 field surveys in addition to those described under Alternative Group A would be required under
15 Alternative Group B.

16 17 **I.2.3 Alternative Group C**

18
19 **LLBGs in the 200 East Area and 200 West Area.** No other impacts in addition to those described
20 for habitats and plant and animal species under Alternative Group A are expected to occur under
21 Alternative Group C. No other field surveys in addition to those described under Alternative Group A
22 would be required under Alternative Group C.

23
24 **Proposed Disposal Facility Near PUREX in 200 East Area.** No other impacts in addition to those
25 described for habitats and plant and animal species under Alternative Group A are expected to occur
26 under Alternative Group C. No other field surveys in addition to those described under Alternative Group
27 A would be required under Alternative Group C.

28
29 **Area C.** No other impacts in addition to those described for habitats and plant and animal species
30 under Alternative Group A are expected to occur under Alternative Group C. No other field surveys in
31 addition to those described under Alternative Group A would be required under Alternative Group C.

32
33 **Area C Stockpile Area and Conveyance Road.** No other impacts in addition to those described for
34 habitats and plant and animal species under Alternative Group A are expected to occur under Alternative
35 Group C. No other field surveys in addition to those described under Alternative Group A would be
36 required under Alternative Group C.

37 38 **I.2.4 Alternative Groups D₁, D₂, and D₃**

39
40 **LLBGs in the 200 East Area and 200 West Area.** No other impacts in addition to those described
41 for habitats and plant and animal species under Alternative Group A are expected to occur under
42 Alternative Groups D₁, D₂, or D₃. No other field surveys in addition to those described under Alternative
43 Group A would be required under Alternative Groups D₁, D₂, or D₃.

1 **Proposed Disposal Facility Near PUREX in 200 East Area.** Proposed disposal near the PUREX
2 Plant occurs only under Alternative Group D₁. No other impacts in addition to those described for
3 habitats and plant and animal species under Alternative Group A are expected to occur under Alternative
4 Group D₁. No other field surveys in addition to those described under Alternative Group A would be
5 required under Alternative Group D₁.
6

7 **ERDF – Impacts to Habitats and Plant Species of Concern.** Disposal in the ERDF occurs only
8 under Alternative Group D₃. The majority of the ERDF site has not been completely surveyed. The
9 ERDF site and some of the surrounding area was burned in the 24 Command Fire. The area comprising
10 the ERDF site before the 24 Command Fire generally consisted of mature sagebrush habitat with varying
11 understory components. The dominant understory component over approximately 90 percent of the area
12 was a mix of cheatgrass and Sandberg's bluegrass. The dominant understory component over
13 approximately 10 percent of the area was a mix of cheatgrass and needle-and-thread grass (DOE-RL
14 1995c).
15

16 A winter survey of a previously contemplated ERDF rail line was conducted in 1993. Sections 4
17 and 5 of the rail line fell within the northern half of the ERDF site (Brandt 1994). The plant species
18 observed within these two sections at that time are provided in Brandt (1994). The dominant overstory
19 species at that time was sagebrush at 25 percent to 50 percent cover, and the dominant understory species
20 was cheatgrass at 50 percent to 75 percent cover. The only observed plant species of concern was the
21 stalked-pod milkvetch.
22

23 This field survey covered only a relatively small portion of the ERDF site and was conducted outside
24 the growing season for most herbaceous plants and prior to the 24 Command Fire of June 2000.
25 Consequently, a spring 2003 field survey is planned to completely characterize the current habitat
26 associations and plant species on the ERDF site.
27

28 **ERDF – Impacts to Wildlife and Wildlife Species of Concern.** Wildlife species observed along the
29 previously contemplated ERDF rail line are summarized for the entire line in Brandt (1994). The only
30 evidence of species of concern observed within the ERDF site were inactive nests of the loggerhead
31 shrike (*Lanius ludovicianus*), a Washington State candidate species and a federal species of concern
32 (species whose conservation standing is of concern to the U.S. Fish and Wildlife Service but for which
33 status information still is needed).
34

35 This field survey covered only a relatively small portion of the ERDF site, was conducted outside the
36 period of residence of migratory birds and during the period of hibernation of most mammals, and
37 occurred prior to the 24 Command Fire. Consequently, a spring 2003 field survey is planned to
38 completely characterize current wildlife use of the ERDF site.
39

40 **Area C.** No other impacts in addition to those described for habitats and plant and animal species
41 under Alternative Group A are expected to occur under Alternative Groups D₁, D₂, or D₃. No other field
42 surveys in addition to those described under Alternative Group A would be required under Alternative
43 Groups D₁, D₂, or D₃.
44

1 **Area C Stockpile Area and Conveyance Road.** No other impacts in addition to those described for
2 habitats and plant and animal species under Alternative Group A are expected to occur under Alternative
3 Groups D₁, D₂, or D₃. No other field surveys in addition to those described under Alternative Group A
4 would be required under Alternative Groups D₁, D₂, or D₃.

5 6 **I.2.5 Alternative Groups E₁, E₂, and E₃**

7
8 **LLBGs in the 200 East Area and 200 West Area.** No other impacts in addition to those described
9 for habitats and plant and animal species under Alternative Group A are expected to occur under
10 Alternative Groups E₁, E₂, or E₃. No other field surveys in addition to those described under Alternative
11 Group A would be required under Alternative Groups E₁, E₂, or E₃.

12
13 **Proposed Disposal Facility Near PUREX in 200 East Area.** Proposed disposal near the PUREX
14 Plant occurs only under Alternative Groups E₂ and E₃. No other impacts in addition to those described for
15 habitats and plant and animal species under Alternative Group A are expected to occur under Alternative
16 Groups E₂ or E₃. No other field surveys in addition to those described under Alternative Group A would
17 be required under Alternative Groups E₂ or E₃.

18
19 **ERDF.** No other impacts in addition to those described for habitats and plant and animal species
20 under Alternative Group D₃ are expected to occur under Alternative Groups E₁, E₂, or E₃. No other field
21 surveys in addition to those described under Alternative Group D₃ would be required under Alternative
22 Groups E₁, E₂, or E₃.

23
24 **Area C.** No other impacts in addition to those described for habitats and plant and animal species
25 under Alternative Group A are expected to occur under Alternative Groups E₁, E₂, or E₃. No other field
26 surveys in addition to those described under Alternative Group A would be required under Alternative
27 Groups E₁, E₂, or E₃.

28
29 **Area C Stockpile Area and Conveyance Road.** No other impacts in addition to those described for
30 habitats and plant and animal species under Alternative Group A are expected to occur under Alternative
31 Groups E₁, E₂, or E₃. No other field surveys in addition to those described under Alternative Group A
32 would be required under Alternative Groups E₁, E₂, or E₃.

33 34 **I.2.6 No Action Alternative**

35
36 **LLBGs in the 200 East Area and 200 West Area.** No other impacts in addition to those described
37 for habitats and plant and animal species under Alternative Group A are expected to occur under the No
38 Action Alternative. No other field surveys in addition to those described under Alternative Group A
39 would be required under the No Action Alternative.

40
41 **Proposed Disposal Facility Near PUREX in 200 East Area.** No other impacts in addition to those
42 described for habitats and plant and animal species under Alternative Group A are expected to occur
43 under the No Action Alternative. No other field surveys in addition to those described under Alternative
44 Group A would be required under the No Action Alternative.

1 **Additional CWC Buildings.** No other impacts in addition to those described for habitats and plant
2 and animal species under Alternative Group B are expected to occur under the No Action Alternative. No
3 other field surveys in addition to those described under Alternative Group B would be required under the
4 No Action Alternative.

5
6 **Area C.** No other impacts in addition to those described for habitats and plant and animal species
7 under Alternative Group A are expected to occur under the No Action Alternative. No other field surveys
8 in addition to those described under Alternative Group A would be required under the No Action
9 Alternative.

10
11 **Area C Stockpile Area and Conveyance Road.** No other impacts in addition to those described for
12 habitats and plant and animal species under Alternative Group A are expected to occur under the No
13 Action Alternative. No other field surveys in addition to those described under Alternative Group A
14 would be required under the No Action Alternative.

15 16 **I.2.7 Mitigation**

17
18 Most biological resources in the Industrial-Exclusive Area of the 200 Areas Plateau were destroyed or
19 displaced during the 24 Command Fire. However, some habitats and species would be subject to
20 mitigation under existing biological conditions and current mitigation guidelines, as prescribed in BRMaP
21 (DOE-RL 2001) and the *Hanford Site Biological Resources Mitigation Strategy* (BRMiS) (DOE-RL
22 2003).

23
24 This section sets forth what the current mitigation requirements for these habitats/species would be if
25 these were to be disturbed in their current condition under current mitigation guidelines. This is done for
26 the purpose of comparison among the alternative groups because current biological conditions and
27 mitigation guidelines are inappropriate for determining actual mitigation requirements for impacts that
28 would not occur for at least another decade. In the interim, habitats and species assemblages may change
29 (e.g., fire-damaged habitats may recover), as might mitigation guidelines at Hanford. Consequently,
30 actual mitigation requirements will depend on the results of field surveys conducted during the growing
31 season just prior to initiating operations, as well as on the mitigation guidelines in effect at Hanford at that
32 time.

33
34 According to BRMaP (DOE-RL 2001), mitigation should be considered for biological resources
35 categorized as Level II and above (Table I.3). The current mitigation requirements for the Level II and
36 above resources described in the preceding sections are discussed below.

37
38 **Level I Habitat Resources.** All habitats described in the preceding sections that were not designated
39 Level II or above are considered Level I resources, and no mitigation is required (Table I.3) (DOE-RL
40 2001).

41
42 **Level II Habitat Resources.** Mitigation of Level II habitat resources generally is accomplished by
43 avoidance and impact minimization (Table I.3). However, in some cases where Level II resources fall
44 into the category of recovering shrub-steppe habitat, and field surveys of the affected area confirm that

Table I.3. General Classes of Mitigation Actions and Biological Resource Levels of Concern to Which They Apply (DOE-RL 2001)

Class of Mitigation Action	Resource Level ^(a)			
	I	II	III	IV
Avoidance ^(b) /Minimization ^(c)	No	Yes	Yes	Yes
Replacement by Rectification ^(d) /Compensation ^(e)	No	No	Yes	Yes ^(f)
(a) See Table I.1 for resource level definitions. (b) Avoidance = eliminate all or part of a project or alter the timing, location, or implementation to avoid injury to biological resources of concern. (c) Minimization = alter project timing, location, or implementation to minimize injury to biological resources of concern. (d) Rectification = replace biological resources of concern on the site to be disturbed. (e) Compensation = replace lost biological resources of concern away from the site to be disturbed. (f) Rectification is probably not possible nor an appropriate means of mitigation at this level; compensatory mitigation can be used but only when it is achieved by acquisition and/or protection of in-kind resources.				

sagebrush recovery (defined as sagebrush habitat with immature sagebrush regenerated through natural processes) is well under way, replacement mitigation (rectification or compensation [Table I.3]) is recommended (DOE-RL 2001).

Replacement mitigation for disturbance of the widely scattered mature big sagebrush located in the southeastern portion of the cheatgrass/Sandberg's bluegrass/Jim Hill's tumble mustard community in Area C (see Figure I.4) is not recommended. Because no immature sagebrush was observed during the summer 2002 field survey (Sackschewsky 2002d), sagebrush recovery is not currently occurring, by definition. Nonetheless, this habitat would be subject to mitigation via avoidance and impact minimization (Table I.3).

Replacement mitigation for disturbance of the sagebrush habitat within the gray rabbitbrush/cheatgrass community in Area C (see Figure I.4) is not required. The sagebrush within this community occurs over an area smaller than the current mitigation threshold for the 600 Area (0.5 ha [1.25 ac]) (DOE-RL 2003), and it covers only 1 percent of the area in which it occurs, which is much less than the current mitigation requirement of at least 10 percent cover (DOE-RL 2003). Nonetheless, this habitat would be subject to mitigation via avoidance and impact minimization (Table I.3).

Level III Habitat Resources. Disturbance of 5 ha or more of mature sagebrush habitat is the mitigation threshold in the southern half of the 200 East Area (DOE-RL 2003). Mitigation for disturbance of the mature sagebrush habitat on the site of the proposed disposal facility near PUREX would first be by avoidance and impact minimization. However, when avoidance and impact minimization are not possible or their application still results in adverse residual impacts above 5 ha, as would be the case in construction of the disposal facility, replacement mitigation is required (DOE-RL 2001).

Level IV Habitat Resources. Element occurrences are defined as Level IV resources (see Table I.1) because they are of such high quality (i.e., they show little or no indication of human impact or invasion by non-native species, or they have significant wildlife usage) and/or rarity that they cannot be mitigated

1 unless it is by compensation via the setting aside and protection of in-kind (i.e., similar type and quality)
2 resources (DOE-RL 2001). There are three element occurrences in Area C. Mitigation recommendations
3 for these follow.

4
5 The cheatgrass/needle-and-thread grass/Indian ricegrass community (Figure I.4) is an element
6 occurrence of the bitterbrush/Indian ricegrass sand dune complex community type (Figure I.3).
7 Disturbance of the cheatgrass/needle-and-thread grass/Indian ricegrass community would be mitigated via
8 the setting aside and protection of an element occurrence of the bitterbrush/Indian ricegrass sand dune
9 complex community type located away from Area C. The size of the replacement community should
10 approximate that of the lost community, 97 ha (241 ac). Ample element occurrences of this community
11 type currently exist elsewhere in the 600 Area of the Hanford Site to satisfy this size constraint
12 (Figure I.5).

13
14 The needle-and-thread grass/cheatgrass community (Figure I.4) is an element occurrence of the
15 sagebrush/needle-and-thread grass community type (Figure I.3). Disturbance of the needle-and-thread
16 grass/ cheatgrass community would be mitigated via the setting aside and protection of an element
17 occurrence of the sagebrush/needle-and-thread grass community type located away from Area C. The
18 size of the replacement community should approximate that of the lost community, 5 ha (12.5 ac). Ample
19 element occurrences of this community type currently exist elsewhere in the 600 Area of the Hanford Site
20 to satisfy this size constraint (Figure I.6).

21
22 The Sandberg's bluegrass/cheatgrass community (Figure I.4) is an element occurrence of the big
23 sagebrush/bluebunch wheatgrass community type (Figure I.3). Disturbance of the Sandberg's bluegrass/
24 cheatgrass community would be mitigated via the setting aside and protection of an element occurrence of
25 the big sagebrush/bluebunch wheatgrass community type. The size of the replacement community should
26 approximate that of the lost community, 1.5 ha (4 ac). Element occurrences of this community type
27 within the 600 Area are currently limited to Gable Mountain and the north side of Vernita Quarry
28 (Figure I.7).

29
30 **Level I Species Resources.** Crouching milkvetch (located in the 218-E-10 and 218-E-12B LLBGs in
31 the 200 East Area and in Area C) and stalked-pod milkvetch (located in the 218-W-5 LLBG in the
32 200 West Area, Area C, the stockpile area and conveyance road area, the area designated for the new
33 processing facility, and ERDF) are considered Watch List species by Washington State, the lowest level
34 of listing for plant species of concern in the state. Watch List species are thus considered Level I
35 resources under BRMaP, for which no mitigation is required (Table I.3) (DOE-RL 2001).

36
37 **Level II Species Resources.** Purple mat (located in Area C) is considered a Washington State
38 Review 1 species. Review 1 species are considered Level II resources under BRMaP, for which
39 mitigation requirements consist of avoidance and impact minimization (Table I.3) (DOE-RL 2001).

40
41 **Level III Species Resources.** Piper's daisy was formerly present in the 218-E-12B and 218-E-10
42 LLBGs in the 200 East Area. Mitigation for this species would not currently be required because it is
43 now absent in the areas where it formerly occurred. However, mitigation would be considered if
44 populations were to recover prior to initiating operations. Therefore, the presence/absence of Piper's



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Figure I.5. Element Occurrences of Bitterbrush/Indian Ricegrass Sand Dune Complex Community Type Outside Area C in 600 Area of Hanford Site

daisy populations on the 218-E-12B and 218-E-10 LLBGs should be determined via a field survey during the growing season just prior to initiating operations.

Summary. The habitats and species that are subject to mitigation based on existing conditions and current mitigation guidelines are summarized by alternative group in Table I.4. All habitats/species subject to mitigation, with their associated mitigation actions, occur in each of the alternative groups, with the exception of the mature sagebrush habitat at the site of the proposed disposal facility near PUREX (Table I.4). Consequently, the alternative groups can be differentiated only with respect to mitigation of this habitat.